Climate Change and Woodlands

Massive opposition has been mobilised to ensure that UK forests will be managed in the public interest and kept in trust for future generations. But is this enough to ensure their preservation? Unfortunately, without action to halt climate change, future generations will find woods significantly different from those we know today.

This briefing sets out what we know about the current and future impacts of climate change on the UK's native woodland.

Climate change: Impact so far

A trend of rising global temperature is clear over the past 200 years, particularly from the late 20th century (the eight warmest years since records began have all been since 1997). There is a clear link to rising concentrations of greenhouse gases in the atmosphere, principally CO2, due to the burning of fossil fuels and deforestation. [1]

In the UK, long-term records show trends over past decades, even centuries, in the timing of lifecycles of plants and animals, and how these relate to temperature. For example, records show that a pedunculate oak (Quercus robur) in Surrey now comes into leaf around 25 days earlier than it did in the 1950s. [2]

The laying dates of birds and migration movements have also been affected by temperature change. And, in recent years, there has been an increase in the number of frogs and toads spawning before Christmas, putting them at risk from periods of winter cold.

The threat to UK native woodland

As the UK warms, more mobile species will be able to migrate northwards, but others may not be able to respond fast enough. These may include plants that are characteristic of ancient woodland, such as great woodrush and wood horsetail.

Alterations in seasons such as earlier springs and milder winters will favour some species at the expense of others. For example, flowers such as bluebells and snowdrops start the process of growth for the next year from late summer through the winter as bulbs This processin the past, has given them a head start over other plants. However, in the future, plants such as garlic mustard and cow parsley may be able to begin leaf growth much earlier whereas bluebells and snowdrops may lose their advantage.

Similarly, the sycamore is responding fastest to climate change. Its large leaves all too often shade out later-leafing, native plant species. In the future it could have an even more dominating influence on our woods.

Beech woodlands may become a thing of the past in southern England, as it is one of the species most sensitive to drought and water stress. This means parts of London, East Anglia and the Midlands might become unsuitable for the species in the near future. A failure to meet its winter chilling requirements might also drive beech out of much of the South West.

Warmer conditions, including easier winters, would lead to an increased risk from pests and diseases, such as Phytopthora, a fungal parasite. Non-native species are a particular threat, such as the Asian longhorn beetle, a devastating pest of many hardwood trees, which thus far has not reached the UK.

Alongside these effects, higher frequency and severity of extreme weather is expected. This could result in damage to woodland fragments, older trees and trees in exposed conditions, and long term damage to sensitive species as a result of flooding.

Importantly, the scale of these future changes depends on whether effective action is taken now to reduce global emissions of greenhouse gases. [3]

Trees capture carbon!

Most of the Earth's natural stores of carbon are in the oceans and tropical forests (where storing of carbon is active) and in fossil fuel reserves (former oceans and tropical forests where the carbon was stored millions of years ago).

Trees store carbon by absorbing CO2 from the atmosphere. This is converted (by photosynthesis) into stored matter containing organic carbon (trunk, roots, etc. and this is called biomass) and oxygen and water, which are released back into the atmosphere. When individual trees die and rot, the stored carbon is released back into the atmosphere. But the release of CO2 can be slowed by retaining and managing biomass products.

[1] NASA press release 11-014 'NASA Research Finds 2010 Tied For Warmest Year On Record'

[2] Ray, D., Morison, J. and Broadmeadow, M (2010) Climate change: impacts and adaptation in England's woodland. Forestry Commission

[3] This briefing is based on the Woodland Trust's report, *A Midsummer Night's Nightmare? The future of UK woodland in the face of climate change*, available on their website.

Existing UK forests, including soils, have a large store of carbon (estimated at around 790 million tonnes of CO2) and a system for removing CO2 from the atmosphere (about 15 million tonnes of carbon dioxide per year in 2007).

It is widely recognised that old forests are valuable storehouses of carbon and should be protected. Logging old-growth forests and replacing them with plantations intended for timber or paper production results in a net loss of carbon that is released into the atmosphere.

Current rates of forestation absorb enough carbon to offset 7-16% of the annual increase in carbon emissions.

Window of opportunity

The most important forest measure to curb climate change is to halt deforestation. Afforestation provides a window of opportunity to cut carbon emissions, but it is important that this process is carried out in an ecologically and socially sustainable manner.

Tree and woodland cover in and around urban environments also has an increasingly important role in helping society adapt to climate change by providing shadier urban landscapes, managing local microclimates and temperatures, and by helping to control surface water, including flooding.

Forests are cost effective ways of combating climate change!

The UK parliamentary committee on climate change considered that carbon abatement (reduction) costing less than £100 per tonne of CO2 was cost-effective. However, mixed woodland managed for multiple objectives can deliver abatement at less than £25 per tonne CO2. This provides highly cost-effective and achievable abatement of emissions of greenhouse gases when compared with potential abatement options across other sectors. It has been estimated that forests globally could provide abatement equivalent to roughly 25% of current CO2 emissions from fossil fuels by 2030, through a combination of reduced deforestation, forest management and afforestation.

Sustainable forest management and development not only maintains the carbon store of a forest at a constant level, helping the prevention of climate change and the threat that it poses, but delivers many other potential benefits, including a vital role in hydrological cycles, biodiversity and conservation, soil stability, amenity/recreation, and cultural value. [4]

Expansion of our forests

Forests have effective ways of contributing to combating climate change. We have to plant more trees and manage them better. This needs a massive co-ordinated drive, which is best led by the Government through the Forestry Commission, the very agency designed to manage the forests on behalf of the public. Despite the recent government 'yew-turn', the cuts of 25% in Forestry Commission, announced in the 2010 spending review will severely compromise the Commission's ability to retain a decent forestry estate with protected access and services, and to protect biodiversity, wildlife and the environment.

Whittling away at the Forestry Commission shows that the Government is evading its civic responsibility to spread the forests in order to combat Climate Change.[5]

[4] References: COMBATING CLIMATE CHANGE A ROLE FOR UK FORESTS- THE SYNTHESIS REPORT, published in 2009 by The Stationery Office Limited, 26 Rutland Square, Edinburgh EH1 2BW and the Friends of the Earth briefing on Forests and climate change. (1997)

[5] This briefing sheet was originally produced by the Climate Alliance around the Save our Forests campaign .